

# MAINTENANCE GUIDE NELSON 700 SERIES WATERERS



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### **WARNING! TURN OFF ELECTRICITY WHEN SERVICING WATERER.**

Always turn off power to waterers when using a tool to service or maintain waterer to eliminate risk of electrocution. Read all warnings on page 12.



## Questions?

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## HOW NELSON 700 SERIES WATERERS WORK

**Operating Principal** - Nelson 700 Series Waterer utilizes a patented weight-activated valve. As an animal drinks from the bowl, there is less weight in the drinking bowl, eventually the lead counter weight causes the beam to pivot which opens the valve. Water refills the drinking bowl. When the drinking bowl becomes heavy enough with water the beam returns to its balanced position, pivoting off the valve and shuts off. The weight of the water in the drinking bowl opens and closes this valve. There are no float valves or paddle valves to cause problems.

**Electric Heater** - All Nelson 700 series are available with or without electric heaters. The optional heater is located below the crossbeam underneath the drinking bowl where it will heat the air that surrounds the drinking bowl. The heater is thermostatically controlled and is designed to cycle, meaning that it automatically turns on and shuts off as necessary. When the heater is on, it can get very hot (red hot). The thermostat is attached to the electrical junction box. It is preset at the factory and does not require adjustment.

## MODEL NUMBER LOCATION

Waterer model number is located on the nameplate. Model number is also present on the shipping box, packing list and invoice.



## CLEANING WATERER

### Removing the Drinking Bowl for Cleaning

**1.** To remove the cover on all round models simply push down on the brass button in front of the housing and rotate the cover counter clock-wise. Then lift the cover off. To remove the cover of models 730-10W and 760-10W, which are wall-mounted models with flat backs, push sideways on the brass latch button, lift the front of the cover and pull forward.



**2.** Next, lock the pivot beam with the beam lock lever to close the valve.

**3.** Then, lift the drinking bowl out of the cage, empty the bowl and wipe it with a cloth.

**4.** Replace the drinking bowl in the cage and unlock the pivot beam with the beam lock lever. Water should refill the drinking bowl.

**5.** Next, replace the cover by rotating it clock-wise until the cover latches. For models 730-10W and 760-10W, slide the back-end of the cover in place and then latch the front end down.

**6.** Verify waterer properly refills and shuts-off before leaving.

**Remove Mineral Deposits From Drinking Bowl** - Over an extended period of time mineral deposits can form on the stainless steel bowl. Mineral deposits are often white and chalky in substance. To remove mineral deposits, soak the drinking bowl for 24 hours in a solution consisting of 50% white vinegar and 50% water. The mineral deposits should then easily wipe away. **NOTE: DO NOT** allow a horse to be exposed to a waterer unless the drinking bowl is in place and the top cover is latched. Read all warnings on page 12.



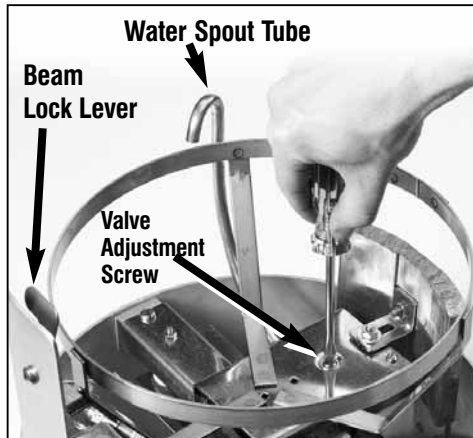
### Clean Underneath Drinking Bowl

1. Turn off electricity to waterer.
2. Remove the top cover, lock the beam with the beam lock lever and remove the drinking bowl.
3. Turn water off at brass shut-off valve and disconnect flare nut with flare fitting connecting the brass shut-off valve to the copper water supply tube. This is a good opportunity to inspect your inline water filter for sediment buildup.
4. Unfasten cross beam by removing cross beam screws and hang cross beam and cage on edge of housing to allow room to vacuum.
5. Use a Wet/Dry Shop Vacuum to remove debris, under bowl.



### ADJUST CONTROL VALVE

Adjusting the control valve is necessary when installing a new waterer, after parts are replaced in an existing waterer and if the waterer is dripping and not shutting off (See Dripping & Overflow).

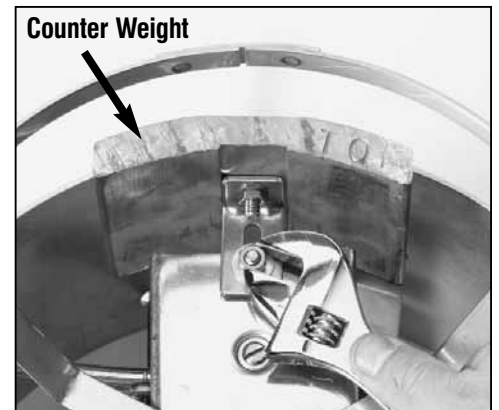


1. Turn off electricity to waterer.
2. Remove top aluminum cover.
3. Next, lock the pivot beam with the beam lock lever to close the valve.
4. Remove drinking bowl.
5. Open the brass shut-off valve by turning it counter clockwise.
6. Using coin or screwdriver, turn control adjustment screw (3/8" stainless steel screw in brass bushing) until a very small stream flows from the water spout tube and breaks-up into drops about 3" below tube outlet. Then turn control valve adjustment screw counter-clockwise which will cause water to stop flowing. Then turn the screw an additional 1/4 turn counter clockwise.
7. Replace drinking bowl, release beam lock lever, and observe water refilling bowl.

**Note:** If, after initial adjustment, water does not completely shut-off and drips, lock the beam lock lever and turn the control valve adjustment screw another 1/4 turn counter-clockwise. Continue this process at 1/4 turn intervals until water shuts-off completely after refilling.

### ADJUST WATER LEVEL IN DRINKING BOWL

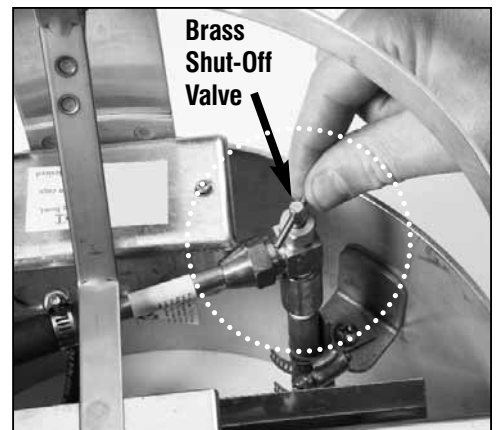
The level of water in the drinking bowl can be controlled by changing the position of the counter weight. Normal water level is about 2-1/2 inches from bottom of the bowl. Level of water in bowl may be raised or lowered (total variation about 1 inch) by moving counter weight toward or away from cross beam. Moving weight away from cross beam raises water level as it then requires more water in bowl to balance beam. To change position of weight, loosen the nut and slide to desired position. Tighten nut making certain weight is square with beam. Weight should not touch insulation or anything which would prevent free movement of beam. Level of water should not contact cast aluminum top cover. This will promote freeze-up as top casting will transfer the heat of the water to the air.



### RATE OF FLOW – BRASS SHUT-OFF VALVE

The brass shut-off valve has two functions.

1. Regulate rate of water flow into drinking bowl.
2. Shut-off water supply when necessary.

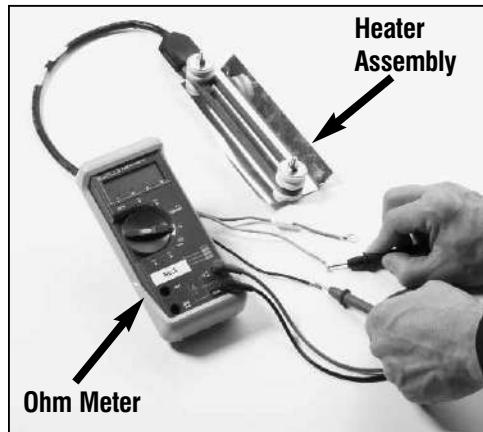


The brass shutoff valve should be opened 1 to 3 turns (or more, depending on water pressure) for normal operation. Water should

not swirl out of bowl when refilling. **Note:** If water seeps from top of brass shut-off valve, tighten packing nut located below valve handle on valve stem. Tighten no more than necessary to stop leakage.

## TESTING HEATING ELEMENT & THERMOSTAT

Test heating element and thermostat with ohm meter.



## HEATER

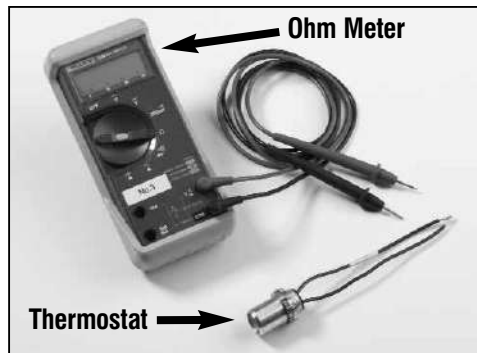
1. Remove heater from waterer (See Removing/Replacing Heater & Thermostat).
2. If the heating element is bent or warped, replace heater. A bent or warped heater is an indication that excessive water has been spilled on heater when heater has been on. Heating element will likely fail in the near future. Excessive water spilled on the heating element likely is an indication that there is sediment in the valve and dripping and overflowing is occurring. See section Dripping & Overflow.
3. Test heater for continuity using an ohm meter. Heating element should be replaced if Ohmmeter is reading either zero or infinity. Heating element is ok if ohmmeter display reads 53-63 ohms on 250-watt element (heater in model 730 waterers) and 41-48 ohms on 325-watt element (heater in model 760 waterers).

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## THERMOSTAT

1. Remove thermostat from waterer (See Removing/Replacing Heater & Thermostat).
2. Place thermostat in freezer for 30 minutes. The thermostat is basically a switch. The cold will cause the thermostat to close.
3. Remove from freezer and test the thermostat for continuity using ohm meter. If continuity is noted, thermostat is working properly. If continuity is zero or infinity, thermostat has failed.



## REPLACING HEATER & THERMOSTAT

Use written instructions below in conjunction with Heater & Thermostat Installation Diagrams on page 10.

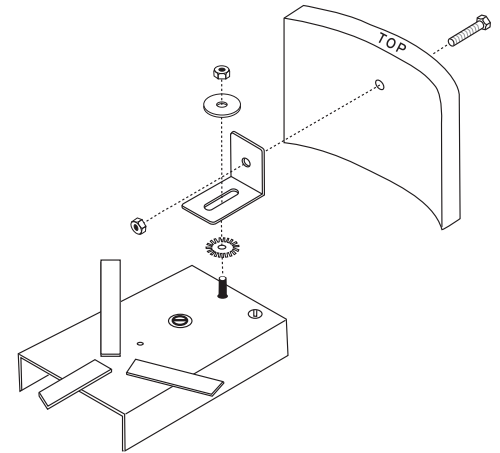
1. To eliminate risk of electrocution turn off electric power supply to waterer.
2. Turn off water to waterer at brass shut-off valve.
3. Remove the pivot beam and cage for easy access to the junction box.
  - A. This is accomplished by first removing the lead counter weight.
  - B. Next remove the cotter key from the tapered end of the brass pivot shaft and slide the brass pivot shaft out.
  - C. The pivot beam and cage may then be removed as a unit.
4. Remove the cover to the junction box and disconnect all wires in the junction box.
5. Take out the thermostat by removing the mounting nut located inside the junction box from the thermostat housing. The thermostat is then free to be removed.
6. With a pair of pliers squeeze the end of the strain relief and pull it out of the junction box
7. Next remove the two nuts securing the heater assembly to the cross beam. This will

allow the heater assembly to be removed from the waterer. The heater assembly consists of the heating element, heat deflector, and two sets of ceramic insulators. There are three ceramic insulators to a set for a total of six ceramic insulators. Also included are two bolts, four nuts and two washers. Now when you purchase a heater it comes as a heater assembly.

8. Locate the heater assembly so that the tip of the heating element is on the same side as the reflector shield located at the end of the cross beam. Snap the strain relief connector to the end of the power cord at the base of the stripped wires. The head of the strain relief connector should be pointed at the heating element.

9. Loop the power cord of the heater over the cross beam along the side of the housing. Place the stripped wires through the junction box in the knock out hole located underneath the thermostat. Snap the strain relief connector into the hole. Connect the wires within the junction box and your heater should work fine.

## WEIGHT INSTALLATION



### Weight Installation:

1. Remove shipping pads from lead weight before installation.
2. Top side of weight is indicated on weight.
3. Moving weight in toward center lowers water level. Moving weight out from center increases water level.



## Questions?

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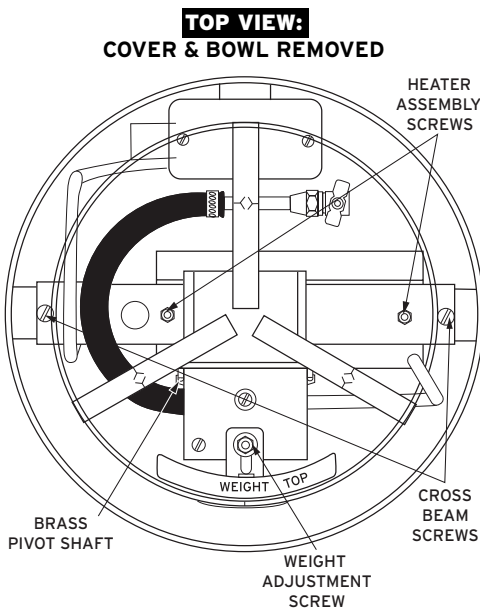
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## TIGHTEN SCREWS



**Tighten Screws:** 1. Tighten screws every fall. 2. Tighten cover clip screws on top cover casting. 3. Verify cotter pins are in each end of brass pivot shaft.

## DRIPPING & OVERFLOW

A waterer that drips when it should be shut-off most likely has sand or other sediment in the control valve. Other causes could be an obstruction which interferes with the movement of the pivot beam or the control valve is out of the adjustment. Follow the steps A through C below to isolate and resolve the dripping problem.

### A. CHECKING FOR OBSTRUCTION

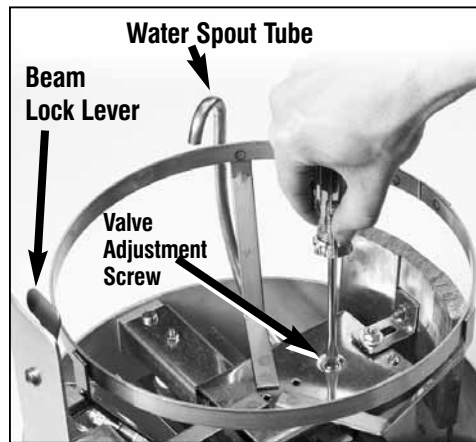
1. To look for an obstruction start with the cover and drinking bowl removed, check the cross beam screws to make sure they are tight.
2. The counterweight must be securely mounted on the pivot beam.
3. Next examine the brass pivot shaft. If a cotter key is missing and the brass pivot shaft

has come out of position, reposition shaft and replace the cotter key.

4. Check the position of the beam lock lever making sure it does not interfere with the movement of the pivot beam or drinking bowl.

5. Finally, check for obstructions below the drinking bowl that prevents the free movement of the pivot beam or the drinking bowl. The brass shut-off valve on the water supply line is usually the obstruction. Inspect the water supply line for interference with any moving parts.

### B. ADJUSTING THE CONTROL VALVE



1. Remove top aluminum casting.
2. Lock the pivot beam with the beam lock lever to close the valve.
3. Remove drinking bowl.
4. Open the brass shut-off valve by turning counter clockwise.
5. Using coin or screwdriver, turn control adjustment screw (3/8" stainless steel screw in brass bushing) clockwise until a very small stream flows from the water spout tube and breaks-up into drops about 3" below tube outlet. Then turn control valve adjustment screw 1/4 counter-clockwise which will cause water to stop flowing. Then turn the screw an additional 1/4 turn counter clockwise.
6. Replace drinking bowl, release beam lock lever, and observe water entering bowl.

**Note:** If, after initial adjustment, water does not completely shut-off and drips, lock the beam lock lever and turn the control valve adjustment screw another 1/4 turn counter-clockwise. Continue this process at 1/4 turn intervals until water shuts-off completely after refilling.

### C. INSPECTING/REPLACING INLINE WATER FILTER & CONTROL VALVE

If dripping and overflow continues and there is no obstruction and the control valve has been adjusted, you will need to remove the inline water filter and control valve to inspect for sediment or worn components. Use the instructions below in conjunction with the diagrams and instructions on page 11.

1. To remove the filter and control valve for inspection you will need to shut-off electric power and shut-off the water supply at the brass shut-off valve.

2. Next, unfasten the fitting connecting the brass shut-off valve to the copper water supply.

3. Then remove the nylon inline filter located just inside the copper water supply tube. A tool such as a pocket knife or needle nose pliers may be required. Now if you see sediment you will need to clean or replace the filter. Also inspect the filter carefully for tears and, if torn, replace the filter.

#### Shut-off Valve

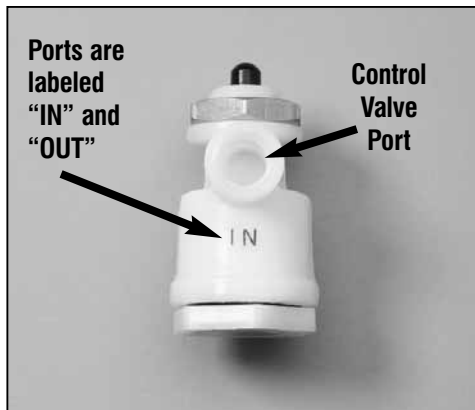
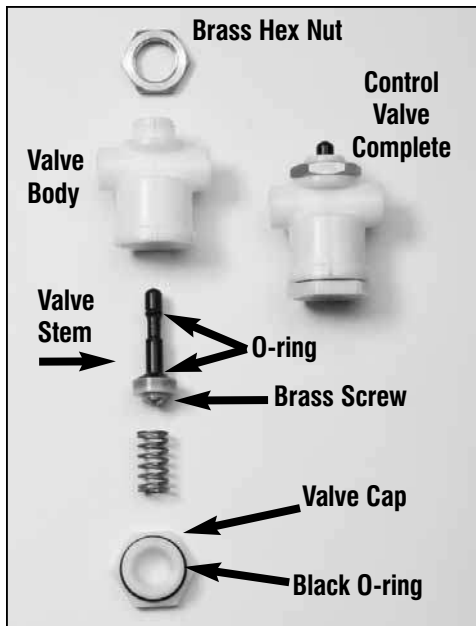
Shut-off valve must be installed properly to service filter (see page 7).



4. Next remove the control valve to inspect for sediment and worn valve parts. With the power and water still off, remove the lead weight then remove the cotter pin from the tapered end of the brass pivot shaft and slide the shaft out. The pivot beam and cage may then be removed as a unit. Remove the brass hex nut that secures the control valve to the bracket.

5. Next unfasten the water supply hose and the copper water spout tube from each end of the control valve.

6. Unscrew the valve cap from the bottom of the control valve to remove the valve stem and stainless steel spring. Now rinse the individual valve components thoroughly with water. Sediment impeding the control valve may not be visible.



**13.** Now adjust the control valve and your problems with dripping and overflow should be fixed.

**Large Cold Water Filter:** If your water contains large amounts of debris, and/or if you have a large number of waterers, install one large cold water filter at a convenient non-freeze location. Consult a licensed plumber.

**Flush Waterline Before Installation.** If waterline is not thoroughly flushed, the inline filter will clog and the control valve may not seal, resulting in dripping and overflow.

### FREEZE-UP

If it is a cold day and the waterer is not refilling or there is ice in the drinking bowl, it is likely that freeze up has occurred. Follow the steps below to isolate and resolve the freeze-up problem.

### 1. INSPECT ELECTRICAL CIRCUIT

**A.** Freeze-up may be the result of a blown fuse or tripped circuit breaker. If a fuse has blown or a breaker has tripped, there may be a safety issue with the circuit. DO NOT turn electrical power on to the waterers until a licensed electrician has inspected the circuit. Keeping electrical power OFF to the circuit will eliminate risk of electrocution.

**B.** Freeze-up may be the result of not having the electrical power switched on to the waterer. This is common during the first cold weather of the season as it is recommended that electrical power be turned off to waterers during non-freezing months. Sometimes the electrical circuit is not turned on for a new installation.

**C.** Nuisance tripping from Ground Fault Interrupters (GFIs) may cause freeze-up. If GFIs are used, it is best that each waterer be

on its own individual electrical circuit so as to reduce nuisance tripping.

**NEXT STEP** - If it is verified that there is electrical power to the waterers go to Step 2 - "Inspect Waterer".

### 2. INSPECT WATERER

**A.** Remove the top cover and drinking bowl to visually inspect the heater. If temperatures are below freezing, the heater should be cycling, turning off and on. The colder the outside temperature the longer the heater will remain on during the cycle. If the heater is working, the crossbeam under the drinking bowl should be warm or even hot to the touch, so be careful. You may see a red glow under the cross beam as the heater can become red hot.

**NEXT STEP** - If there is electrical power to waterer and heater is not cycling, go to Section "Test Heater & Thermostat".

**NEXT STEP** - If the heater is cycling but water is not refilling, go to Step 3 - "Other Causes for Freeze-Up".

### 3. OTHER CAUSES FOR FREEZE-UP

#### A. Brass Shut-Off Valve & Water Supply Hose Location (See diagram on page 9.)

Failure to install the shut-off valve and water supply hose in the proper location may result in freeze-up and the inability to shut-off the water supply and service the inline water filter. Relocate brass shut-off valve and water supply hose if originally installed incorrectly.

#### B. Inadequate Heat Well Size

The most efficient method used to protect the riser pipe from freezing is to utilize the earth's heat. Ground heat is obtained by digging a hole, otherwise known as a heat well directly below the waterer. The earth's heat naturally rises and circulates around the waterline protecting it from freezing. The wider & deeper the heat well, the more ground heat can be obtained. Freeze-up can occur if the heat well is not large enough. Installation instructions state, that when using ground heat to protect the riser pipe from freezing. It is necessary to extend an 8 to 10 inch diameter



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hole 4 or more feet below the frost line. For example, if the frost line is 4 ft, the hole should extend down 8 or more feet. If the heat well does not generate enough ground heat to protect the waterline from freezing, you can purchase Nelson's Waterline Insulation, accessory 1004 direct from the factory. It retains the heat in the waterline while allowing the ground heat to rise and circulate around the waterline.

### C. Obstructions In Heat Well

Waterline freeze-up can result from the heat well being blocked with an obstruction. It's not uncommon for people to choke off the naturally rising geothermal heat by filling the heat well with insulation, sand or dirt. This prevents ground heat from circulating and causes the waterline to freeze.

### D. Vertical Water Line Makes Contact With Heat Well

A vertical waterline that is bowed and makes contact with the wall of the heat well or mounting base above the frost line can freeze at point of contact. This is common with free-standing models not wall-mounted models. Nelson Waterline Insulation Acc. 1004 over the vertical waterline prevents direct contact between waterline and heat well. Insert insulation between the wall of the hole and the waterline if contact is unavoidable.

### E. Air Gaps

Free-standing models - It's common for models mounted to a concrete pad or to a concrete pipe to have air gaps between the housing and concrete base. Air gaps in these areas can freeze the waterline and also cause the heater to run excessively, substantially increasing the cost of operation and reducing heater and thermostat life. Seal the air gaps by caulking with an all-weather sealant where the waterer and base contact.

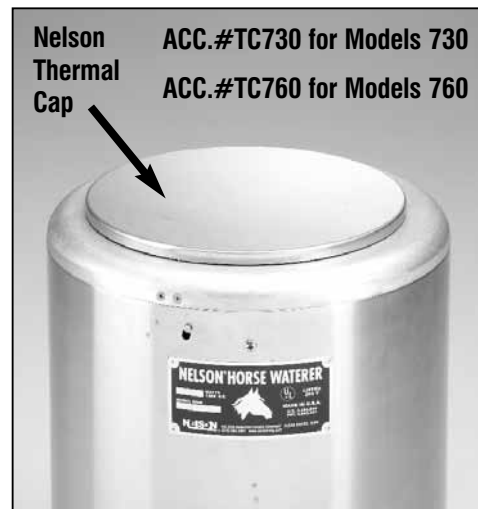
Wall-mounted models - It's common for models mounted to the wall to have air gaps underneath where the waterline comes into the waterer and in the back where the waterer mounts against the wall. Air gaps in these areas can freeze the waterline and also cause the heater to run excessively, substantially increasing the cost of operation and reducing heater and thermostat life. Gaps underneath the waterer can also allow easy entry for mice. Material used to seal the area depends on the size of the gap. Sheet metal and or chalking with an all-weather sealant may be necessary.

### F. Heat Tape

Locating heat tape or heat cable too close to the waterer's thermostat can warm the thermostat, preventing it from activating the heater when the temperature is cold. Conversely, heat tapes often come with thermostats. If the heat tapes thermostat is located too close to the waterers heater, the heat tape may not be activated when necessary. Waterline freeze-up can result.

### G. Copper Water Spout Tube Makes Contact With Cover

DO NOT allow the copper water spout tube to come in contact with the top cover of waterer. Water may freeze at point of contact. The copper water spout tube may be bent slightly to eliminate contact or be covered with



electricians tape to insulate.

### H. Water Level In Drinking Bowl

The water level in the drinking bowl should be adjusted such that water does not come into contact with the cover. The aluminum cover may conduct heat away from the water in the bowl, causing the water to freeze.

### I. Voltage Drop

Voltage drop is the reduction in voltage in an electrical circuit between the source and the waterer. If the proper sized wire is not used to accommodate for voltage drop, inadequate voltage will result. The heater will not heat to capacity and freeze-up will result. This problem is more common when the waterers are located a long distance from the electrical source.

## TAKING WATERER TEMPORARILY OUT OF SERVICE

Waterer is not going to be used for an extended period.

1. Remove top cover and lock down balance beam with beam lock lever.
2. Remove and empty drinking bowl.
3. Inspect area below drinking bowl and cross beam. Remove debris with wet/dry shop vacuum if necessary. See Section "Cleaning Waterer".
4. Turn-off water at brass shut-off valve.
5. Place drinking empty drinking bowl back into waterer.
6. Place top cover on housing and latch securely.
7. Over top cover install Nelson Thermal Cap Accessory. The Nelson Thermal Cap is designed to reduce energy consumption and to keep the waterer clean when not in service.

## WARRANTY

Nelson Manufacturing Company will repair or, at its option, replace without charge, any parts found defective upon examination at the factory if returned within the guarantee period, transportation charges prepaid. Replacement shipment will be made transportation charges prepaid. Nelson Waterers are guaranteed against defects in workmanship and/or materials for one year. Nelson heaters and thermostats are guaranteed against defects in workmanship and/or materials for three years.

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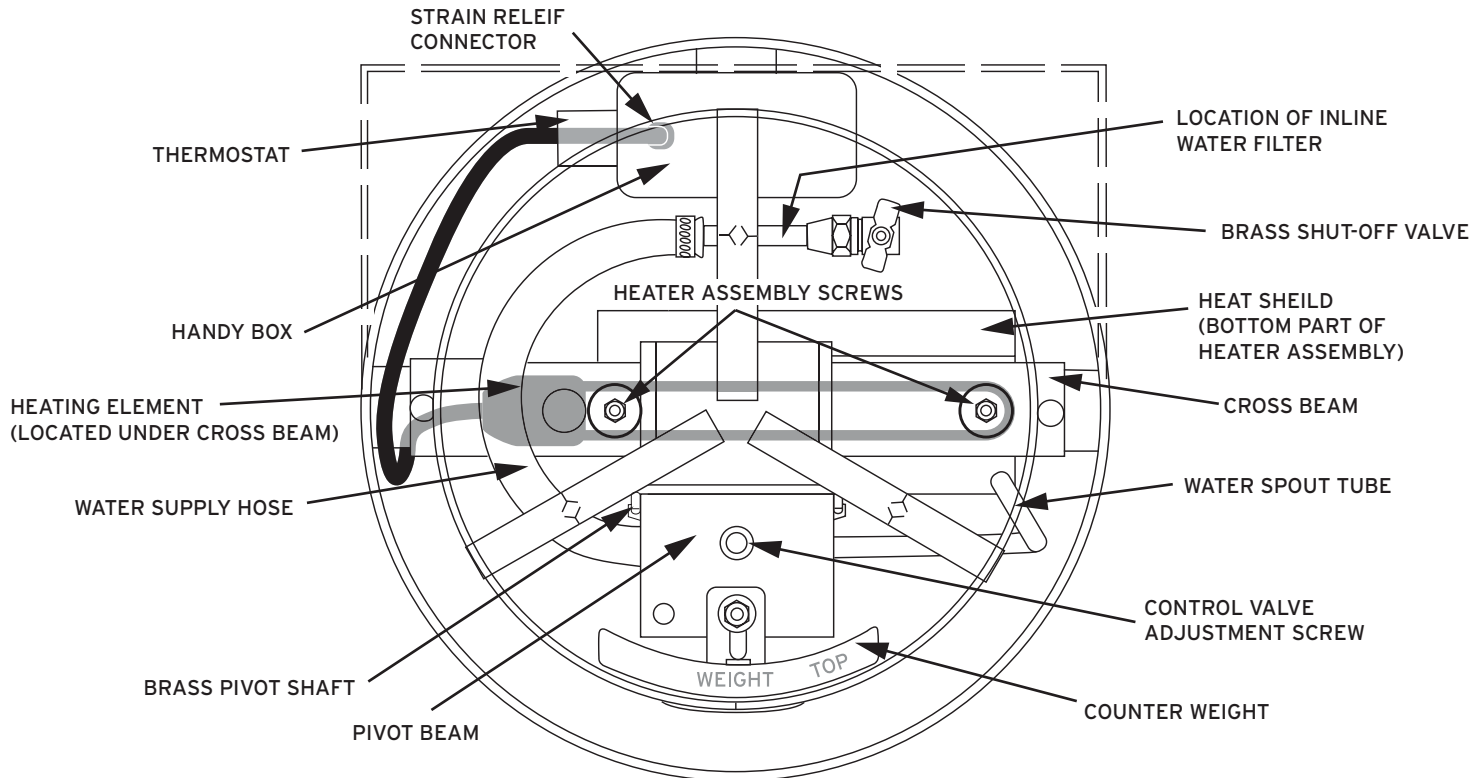
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# Waterer Components - Top Cover & Bowl Removed



## WATERER COMPONENTS

**Pivot Beam** is similar to the long board of a teeter totter. Attached to one end of the pivot beam is the drinking bowl cage and on the other end of the pivot beam is the counter weight. The pivot beam pivots on the brass pivot shaft. The weight of the water in the drinking bowl causes the pivot beam to pivot and activate the control valve. The control valve regulates water coming into the drinking bowl.

**Control Valve Adjustment Screw** is located in the pivot beam directly above the control valve. The control valve adjustment screw opens and closes the control valve. The control valve regulates water coming into the drinking bowl.

**Control Valve** –The control valve regulates the water refilling the drinking bowl. It is located directly below the control valve adjustment screw. The control valve will operate on water pressure from 20 to 80 psi. Optimal pressure range is 40-60 psi. Consult a qualified plumber if your water pressure falls outside of this range. The inlet and outlet ports of the control valve are imprinted on the control valve just below the port holes. “IN” is the port hole the water supply hose feeds and “OUT” is the port hole that feeds the copper water spout tube.

**Brass Pivot Shaft** – The pivot beam pivots on the brass pivot shaft. The brass pivot shaft connects the pivot beam and drinking bowl cage to the cross beam.

**Counter Weight** – The counter weight is attached to the pivot beam on the opposite end from the drinking bowl. Stamped on the counter weight is the word “TOP”, which is to face up when installed.

**Beam Lock Lever.** Locking the pivot beam with the beam lock lever prevents water from coming out the water spout tube while the drinking bowl is removed for cleaning or other maintenance.

**Brass Shut-off Valve** regulates the rate of water flow. Turn the shut-off valve clockwise to close and counter clockwise to open. There are several important reasons to locate the brass shut-off valve and water supply hose in the correct location: 1) freeze protection 2) easy access to the shut-off valve and 3) easy access to the inline water filter.

**Water Supply Hose** fastens to the brass shut-off valve on one end and to the “IN” port of the control valve on the other end. Proper location of the water supply hose and brass shut-off valve are important for several reasons: 1) freeze protection 2) easy access to the shut-off valve and 3) easy access to the inline water filter.

**Inline Water Filter** - is shaped like a pencil and located inside the water supply hose where hose fastens to the brass shut-off valve. The filter’s purpose is to trap sediment in the water before the sediment travels downstream to the control valve. A slow down in rate of water flow into the drinking bowl is an indication that the filter is filling with sediment and may need to be cleaned

**Copper Water Spout Tube** fastens to the “OUT” port of the control valve and refills the drinking bowl with water from above.

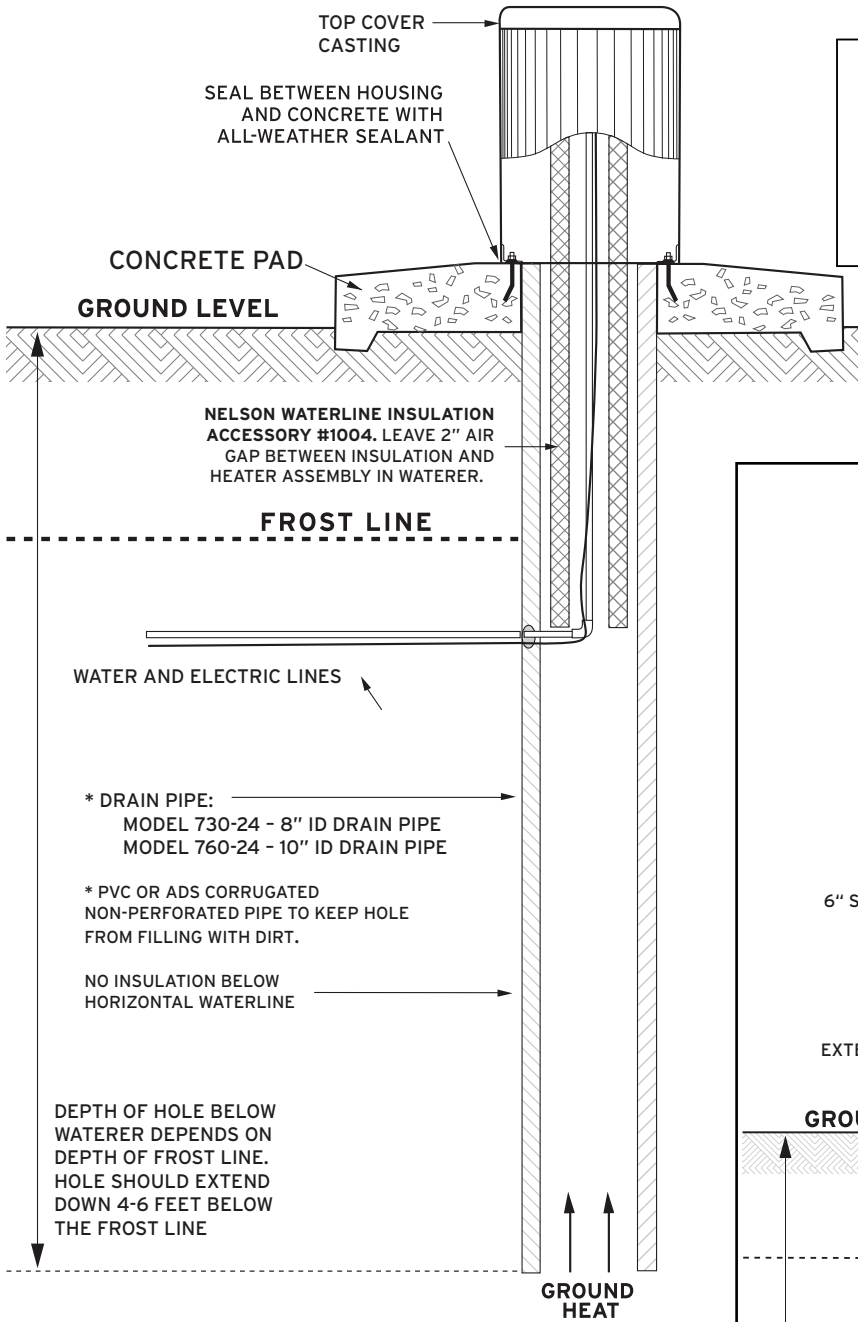
**Heater** is located under the cross beam. The heater heats the air that surrounds the drinking bowl. The heater is activated by the thermostat, turning on and off as necessary. The heater will get very hot (red hot).

**Thermostat** is cylinder shaped metal tube located on the outside of the electrical junction box. The thermostat acts as a switch, turning the heater on and off depending on temperature.

**Strain Relief Connector** is located in electrical junction box and prevents the heater cord from being pulled out of the electrical junction box.

# Installation In Freezing Climates - Protecting Vertical Waterline

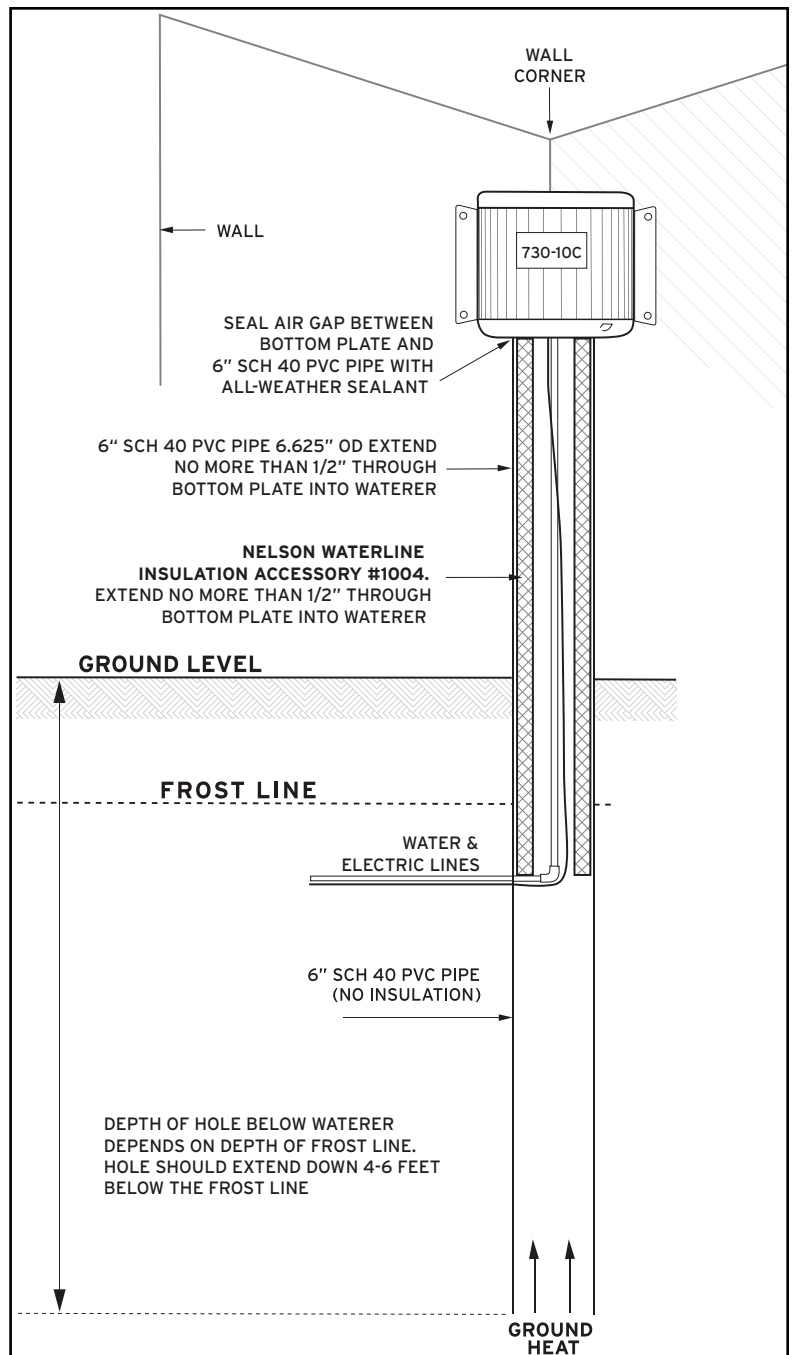
## FREE-STANDING MODEL



### ALWAYS TURN OFF ELECTRICITY TO WATERERS:

1. after winter season when temperatures are consistently above freezing.
2. when using a tool to service or maintain waterer.

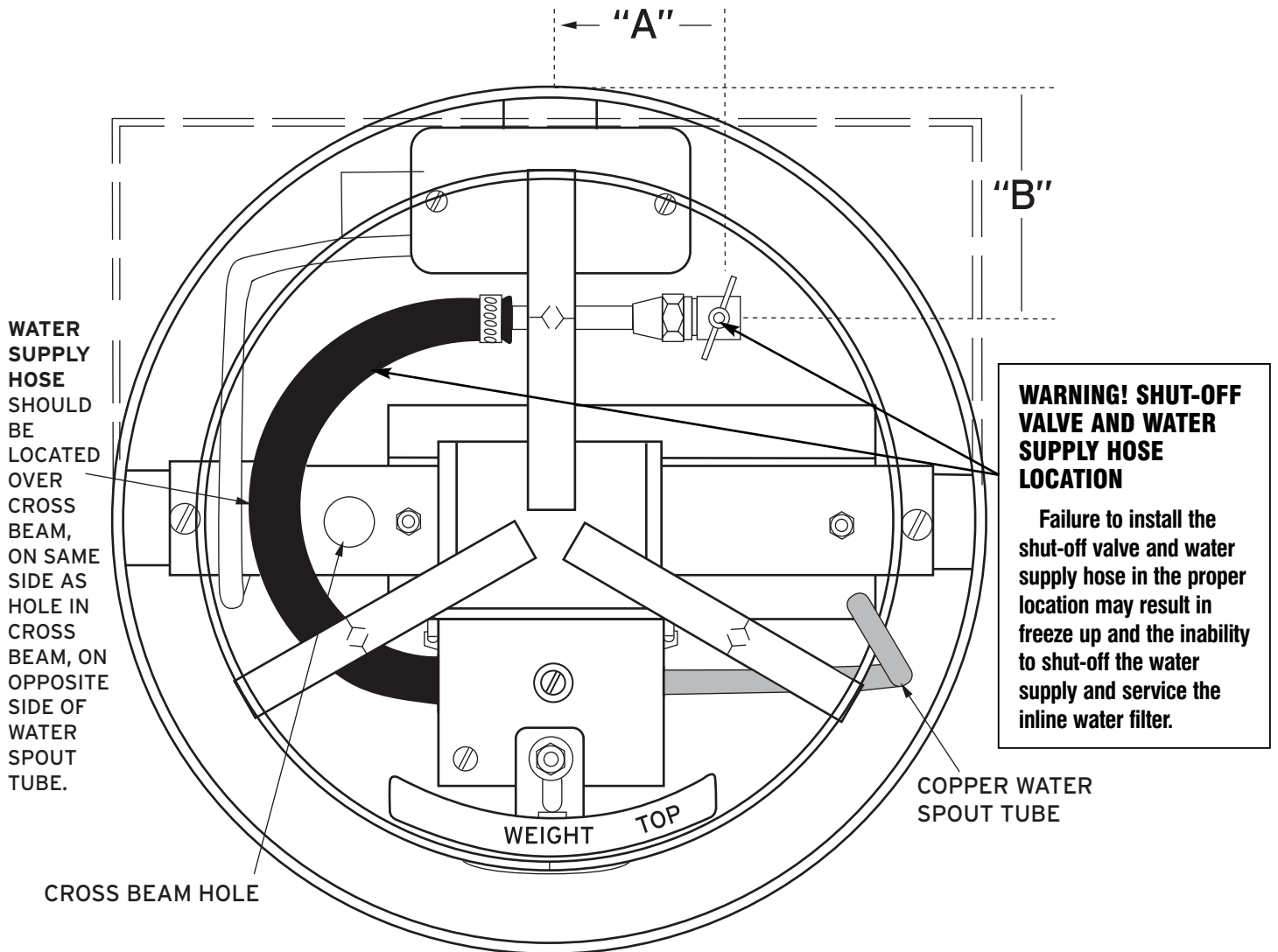
## WALL-MOUNT MODEL





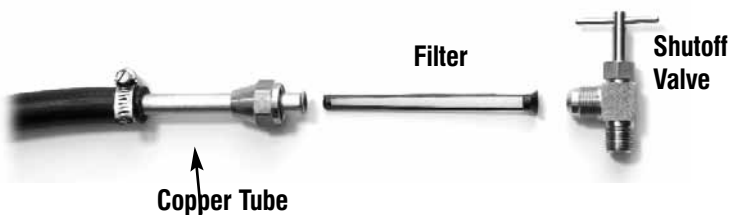
# Installation In Freezing Climate - Plumbing Inside Waterer

## TOP VIEW COVER AND BOWL REMOVED



### WATER FILTER LOCATION

- Flush waterlines before inserting filter and using waterers. If waterline is not completely flushed of debris, filter may clog and control valve may not function properly resulting in dripping and overflow.
- Install a large cold water filter in a non-freeze location if your water contains a lot of debris and/or if you have a large number of waterers.
- **DO NOT** bend/crimp copper tube leading to brass shut-off valve.



### BRASS SHUT-OFF LOCATION

MODEL	"A"	"B"
730 - 10	3"	3-1/2"
730 - 10W	4-1/2"	3-1/2"
730 - 10C	3"	3-1/2"
730 - 24	3"	3-1/2"
760 - 10	3"	4-1/2"
760 - 10W	4-1/2"	4-1/2"
760 - 10C	3"	4-1/2"
760-24	3"	4-1/2"

TOP OF 1/4" FPT FITTING FOR CONNECTING BRASS SHUT-OFF VALVE ON WATER SUPPLY LINE MUST BE SEVEN INCHES (7") BELOW TOP OF HOUSING ON ALL MODELS.

# HEATER & THERMOSTAT INSTALLATION DIAGRAMS

## WARNING! TURN OFF ELECTRICITY WHEN SERVICING WATERER

Always turn off power to waterers when using a tool to service or maintain waterer to eliminate risk of electrocution. Waterers should be on dedicated circuits.

### ELECTRICAL JUNCTION BOX COVER:

- Replace old cover with new cover provided with heaters & thermostats.

### THERMOSTAT IS LOCATED IN ELECTRICAL JUNCTION BOX AS INDICATED IN DIAGRAM.

### STRAIN RELIEF CONNECTOR PREVENTS HEATER CORD FROM BEING PULLED OUT OF JUNCTION BOX. SEE INSTRUCTIONS BELOW.

- Locate Connector on heater cord with large head of Connector on heating element side. Allow enough cord on junction box side for wire connections to be made inside junction box.
- Insert Connector and heater cord in junction box (as indicated in diagram) using pliers and fingers until Connector snaps in place.
- Test by pulling on heater cord toward heating element. Connector and heater cord should not pull out of junction box.

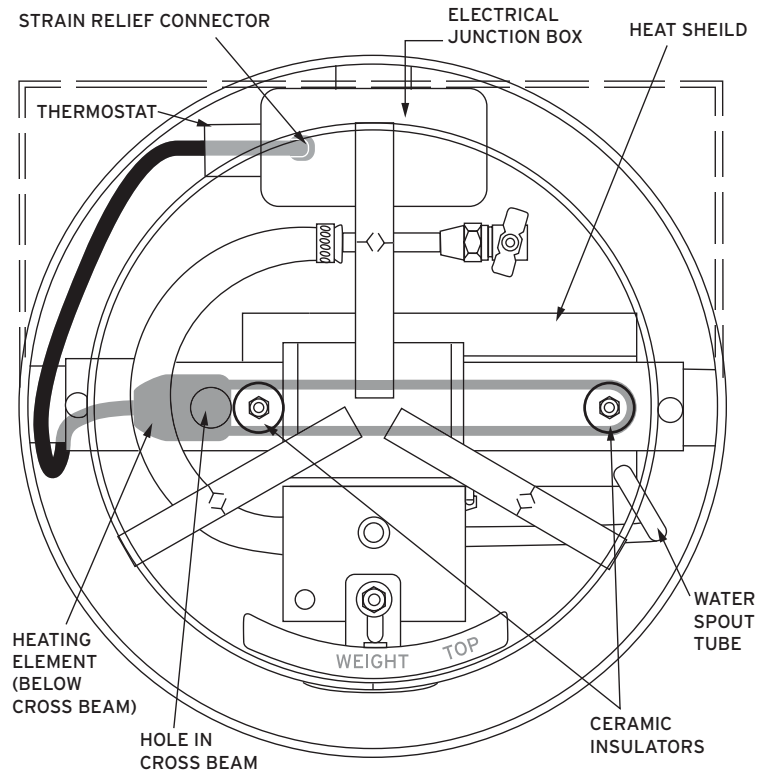
### POWER SUPPLY MUST PROVIDE:

- A HOT wire which is connected to remaining BLACK wire of thermostat.
- A NEUTRAL wire which is connected to WHITE wire of heater.
- A GROUND wire which must be connected to the ground screw in the handy box. This will ground both the waterer and the heating element.

### INTENDED USE:

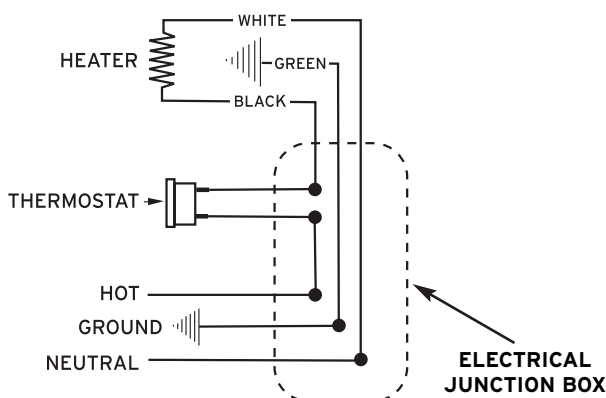
- Thermostat Part 758 is designed for both Models 730 & 760.
- Heater Parts 755C & 755HA are designed for Model 730 Waterers only.
- Heater Parts 785C & 785HA are designed for Model 760 Waterers only.
- Heater's Parts 755C & 785C come with Heating Element, Heat Shield, Ceramic Insulators, Strain Relief Connector and Cover for Junction Box.
- Do not use for any other application.

## TOP VIEW: COVER & BOWL REMOVED



**WARNING! USE CARE NOT** to spill water on heating element. Water on heating element reduces heater life and may lead to freeze-up. Keep area below drinking bowl as dry and clean as possible.

## Heater & Thermostat Wiring Diagram



### WARNING! ELECTRICAL INSTALLATION & MAINTENANCE

Use a licensed electrician to install and maintain the Waterer, so you can be assured that you have complied with all national and local electrical codes and that you have not created a risk of electrocution or fire. Improper installation or maintenance may result in serious injury or death for personnel or animals or damage to structures.

#### A LICENSED ELECTRICIAN WILL DETERMINE:

A) Type and size of service wire, B) grounding procedure, and C) proper fusing of heater.

**GROUND WIRE:** The heating element is grounded to the waterer by a green ground screw at the factory. The ground wire from the power service should be secured to the waterer with the second green ground screw provided in the handy box. When using wire-nuts, follow instruction on wire-nut box. Tape wire nuts to wire to prevent loosening.

**FUSING:** Waterers must be individually fused. Do not over fuse. Consult a licensed electrician. Heating rating @ 120 volts AC.

WATERER	WATTS	AMPS	HEATER #
Model 730	250	2.1	755
Model 760	325	2.7	785

**DEDICATED CIRCUITS** - Waterers must be on dedicated circuits. TURN POWER OFF after the Winter heating season when heaters are no longer needed (temperatures are consistently above freezing) or when performing maintenance on waterers.

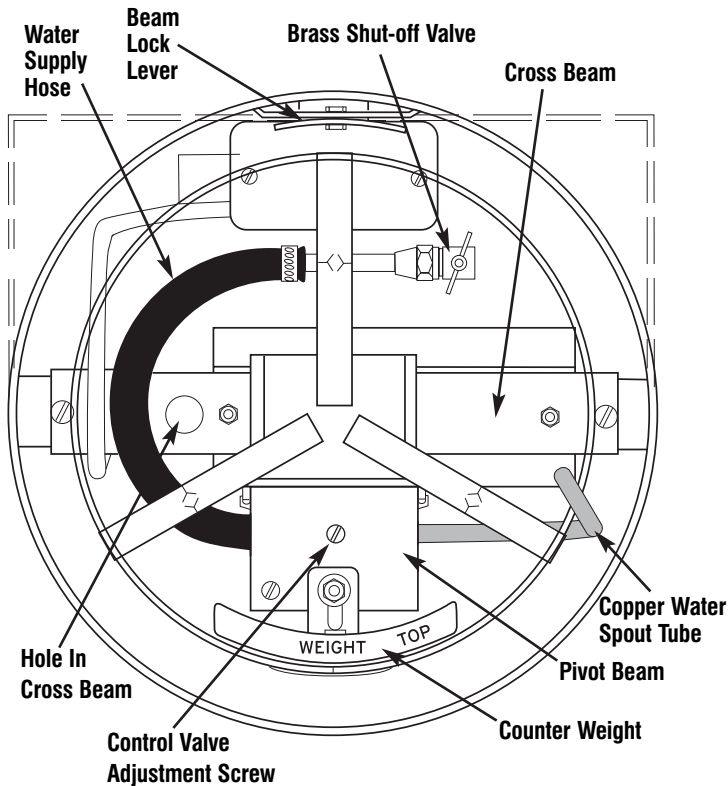


**QUESTIONS?**  
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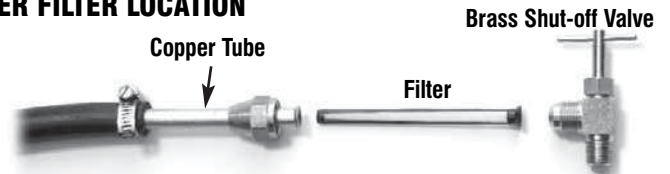
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# Instructions For Replacing Plumbing Parts Including Control Valve & Filter

## TOP VIEW: COVER & BOWL REMOVED

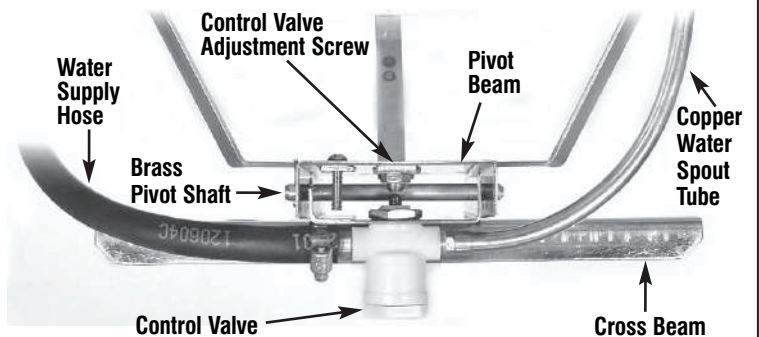


## WATER FILTER LOCATION



- Water supply hose and shut-off valve should be located as shown in diagram on left for easier filter access and maximum freeze protection.
- Install a large cold water filter in a non-freeze location if your water contains a lot of debris and/or if you have a large number of waterers.
- **DO NOT** bend/crimp copper tube leading to brass shut-off valve.

## CONTROL VALVE LOCATION



**WARNING! TURN OFF POWER WHEN SERVICING WATERER.**  
Always turn off power when using a tool to service or maintain waterer to eliminate risk of electrocution. Waterers should be on dedicated circuits.

### Tools Needed:

- Safety glasses
- (1) needle-nose pliers - medium to small size.
- (1) open end or adjustable wrench - 11/16"
- (1) open end wrench - 3/4"
- (1) open or boxed end wrench - 7/8"
- (1) open or boxed end wrench - 7/16"
- (1) straight bit screw driver - 1/4"

### Removing Filter and Control Valve

1. Unlatch and remove top cover casting.
2. Lock the balance beam off the valve using the beam lock lever. This prevents the valve from opening and water pouring from water spout tube.
3. Remove drinking bowl.
4. Shut-off water supply at the brass shut-off valve. (If brass shut-off valve is hard to access, it may be easier to come back to steps 5 and 6 after completing steps 7-9.)
5. Using a 3/4" open end wrench, unfasten the flare nut connected to the shut-off valve. A second wrench (11/16" open or adjustable) may be needed to hold the brass shut-off valve in place while unfastening the brass flare nut.

6. Using needle nose pliers remove nylon water filter located just inside the water supply tube. Set the filter aside for cleaning.
7. Using 7/16" wrench remove the lead counter weight and set aside.
8. Using needle nose pliers remove the cotter pin on the tapered end of the brass pivot shaft and slide the pivot shaft out.
9. The pivot beam and cage may then be removed as a unit. With the pivot beam and cage removed, it is a good opportunity to clean under the cross beam and heater if debris is present. Mice have been known to build nests in this area. A wet/dry shop vacuum works well.
10. Disconnect water spout tube from plastic locator.
11. Using a 7/8" open or box end wrench, remove brass hex nut secures the control valve to the bracket. Plumbing should lift out.
12. Using hands, unscrew water supply hose and water spout tube from each end of the control valve.
13. When installing new control valve, make certain water flows through the valve in the proper direction; otherwise, it will not shut-off. The words "IN" and "OUT" are imprinted on the valve directly below the port holes. Connect the water supply hose to the "IN" port. Connect the copper water spout tube to the "OUT" port. Before connecting the water supply line apply Teflon® pipe tape to the threads of the brass fittings. Avoid pipe joint compound, as some brands harden and fail over time.

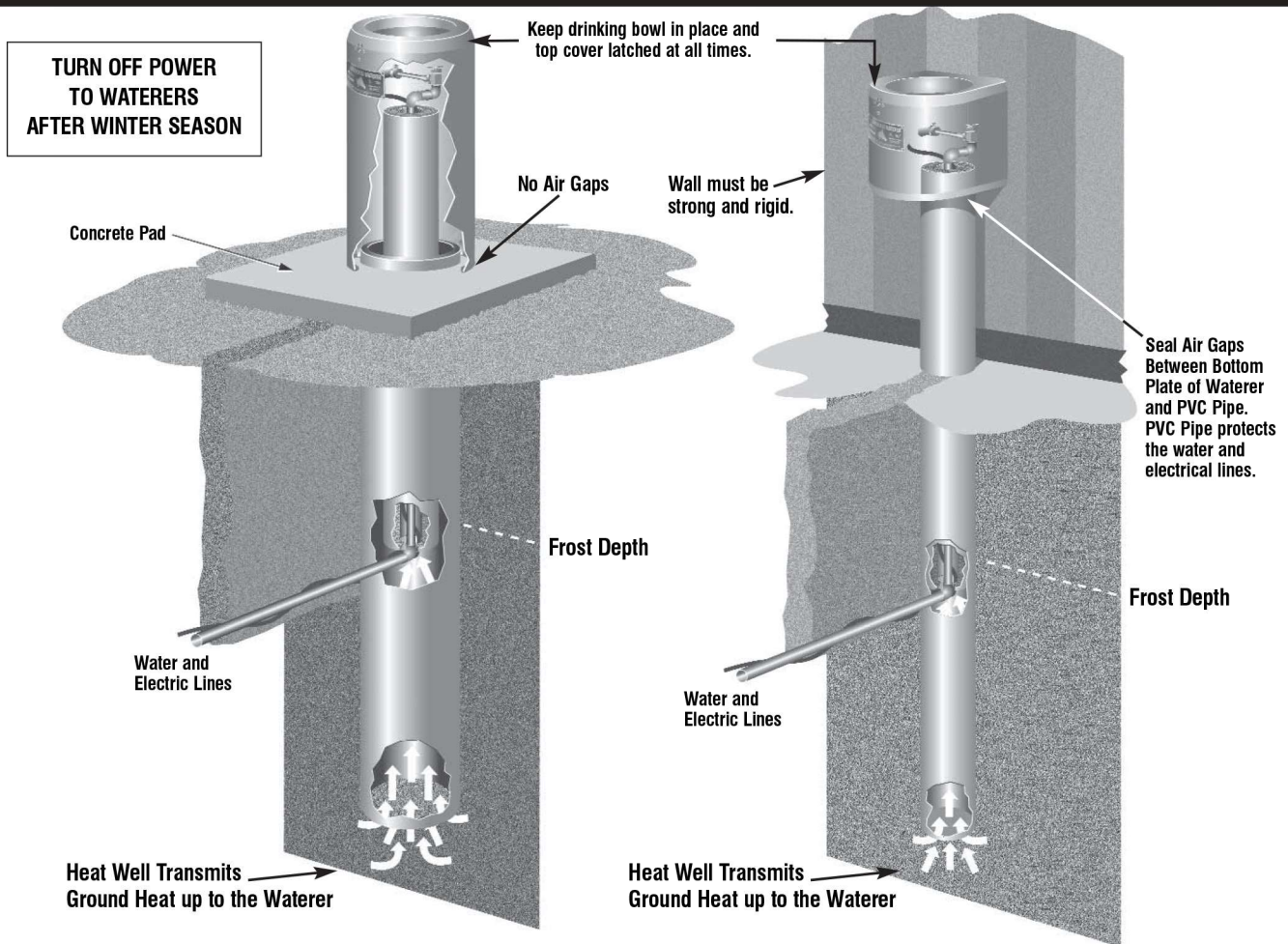
14. \*Reassemble parts (see note).
  15. With beam lock lever still locking pivot beam off valve, open brass shut-off valve.
  16. Adjust control valve at valve adjustment screw.
    - a. Using screw driver, turn valve adjustment screw (3/8" stainless steel screw in brass bushing) until very small stream flows from the water spout tube and breaks –up into drops about 3" below tube outlet. Then turn control valve adjustment screw 1/4 turn counter-clockwise which will cause water to stop flowing.
- Note:** If, after initial adjustment, water does not completely shut-off and drips, lock the beam lock lever and turn the control valve adjustment screw another 1/4 turn counter-clockwise. Continue the process at 1/4 turn intervals until water shuts-off completely after refilling.
17. Insert stainless steel bowl back into waterer, release beam lock lever to allow refilling and latch top cover to housing.
- \*Note:** It is much easier to install the lead counter weight and control valve adjustment screw onto the pivot beam and cage **AFTER** installing pivot beam and cage to the cross beam with the brass pivot shaft.



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# Warnings: Nelson 700 Series Waterers



## **WARNING! Electrical Installation & Maintenance**

Use a licensed electrician to install and maintain the Waterer, so that you can be assured that you have complied with all national and local electrical codes and that you have not created a risk of electrocution or fire. Improper installation or maintenance may result in serious injury or death for personnel or animals or damage to structures.

## **WARNING! Top Cover & Drinking Bowl**

Drinking Bowl should be in waterer and top cover latched to waterer at all times unless personnel are at waterer performing maintenance such as cleaning, inspecting or replacing parts. Failure to comply may give animals access to power supply and may result in serious injury or death to personnel or animals or damage to structure.

## **WARNING! Turn Off Electricity When Servicing Waterer**

Always turn off power to waterers when using a tool to service or maintain waterer to eliminate risk of electrocution. Waterers should be on dedicated circuits.

## **WARNING! Seal Air Gaps**

Seal small air gaps between concrete base and housing of free-standing models and between 6" SCH 40 PVC Pipe and bottom plate on wall mount models. Use all-weather silicon sealant on outside of housing for small air gaps. Call factory or consult installation instructions if a large gap exists. Air gaps allow cold air to enter waterer and can result in freeze-up, excessive energy consumption, and shortened heater and thermostat life.

## **WARNING! Turn Off Electricity After Winter Season**

Always turn off electricity to waterers when heaters are no longer necessary (temperatures are consistently above freezing) to eliminate any risk of accident resulting in electrocution or fire. Waterers should be on dedicated circuits.

## **WARNING! Mounting Base**

Do not mount or set waterers with heaters on top of wooden or combustible bases. This may result in serious injury or death for personnel or animals or damage to structures.

## **WARNING! Inspect Waterers Daily**

Inspect and clean waterers daily. Cleaning (emptying) the drinking bowl will allow you to verify waterers are automatically refilling and heaters are working. If a waterer is not refilling as a result of a power outage and resulting freeze-up or a component failure, animals will not have water. This could lead to dehydration, illness or death.

## **WARNING! DO NOT expose animals to electrical wires**

All electrical wires and insulation should be covered with protective PVC pipe or metal conduit pipe. This will help prevent animals from chewing through electrical wires and creating a risk of fire or electrocution. Consult a licensed electrician to assure you are complying with all local and national codes.

## **WARNING! USE CARE NOT to spill water on heating element**

Water on heating element reduces heater life and may lead to freeze-up. Keep area below drinking bowl as dry and clean as possible.



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